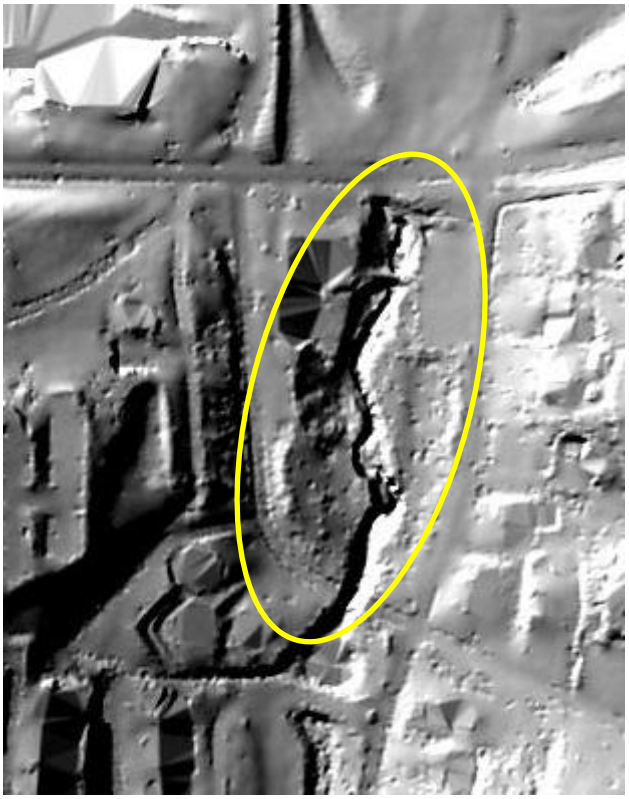
Stream Mitigation Tours
June 16, 2016
Site #1: Unitarian Church Site – Thomas Beck Road

Overview:

This is a site located on a tributary to Gray's Lake. Restoration was done to solve bed degradation, contraction scour, and bank erosion issues. This site has easy trail access and will allow for observation of restored and unrestored segments. The most recent restoration work at this site was completed this spring.



LiDAR Hillshade

1930's Aerial Photo

Budget: Line Items	**Cost**
Excavator	$ 2,875
Skid Steer	$ 1,755
Field Stone	$ 12,500
River Rock	$ 3,392
Boulders	$ 1,025
Conservation Corps Crew (1 week)	$ 5,040
Staff	$ 3,640
Total	$30,227

IOWA STREAM MITIGATION SUMMARY

Project Name	Unitarian Church
Date	1/1/2016
Required Mitigation	**Debits**
Adverse Impacts	0.00
Credit Summary	**Credits**
In Stream Benefits	2619.05
Riparian Buffer Benefits	304.99
Fish Passage Credits	0.00
Total Excess Credits	2924.03

Note: all mitigation credit calculations were completed using the DRAFT changes that IDNR submitted to the USACE in January 2016. Changes to the Method resulting from Interagency Review Team discussions and public comment are expected.

Project Name	Unitarian Church			Date	1/1/2016	
Instructions - For each stream reach, enter dimensions of buffers and choose factor types from the dropdown lists provided.						
ONLY change values in the blue boxes. All scores and values will be calculated automatically.						
	Buffer Area 1		**Buffer Area 2**		**Buffer Area 3**	
Name/Description	**4x Bankful Width**		**Broad flood plain**			
Buffer Dimensions (for info only)	all measurements in feet		all measurements in feet		all measurements in feet	
Average width of buffer (side A)	28					
Average width of buffer (side B)	28					
Stream length	300					
Factor	**Type**	**Score**	**Type**	**Score**	**Type**	**Score**
Net Benefit	A) Buffer Restoration/Establishment	1.20	A) Buffer Restoration/Establishment	1.20	**Choose One**	**
Functional Zone	A - Up to 4x Bankfull Width	1.20	B - Broad Floodplain	0.50	C -Valley Side	-0.60
Site Protection	**Choose One**	**	**Choose One**	**	**Choose One**	**
Credit Schedule	**Choose One**	**	**Choose One**	**	**Choose One**	**
Temporal Lag Factor	A) 0 to 5 years	0.00	A) 0 to 5 years	0.00	**Choose One**	**
Sum of Factors		2.40		1.70		-0.60
Buffer area in square feet		16800		65985		
Buffer Credit Subtotal		80.64		224.35		0.00
Location and Kind Factor	**Choose One**	1.00	**Choose One**	1.00	**Choose One**	1.00
Credits Generated		**80.64**		**224.35**		**0.00**
Additional comments or description:						
TOTAL MITIGATION CREDITS EARNED		**304.99**				

Project Name	Unitarian Church			Date	1/1/2016	
Instructions - For each stream reach, choose factor types from the dropdown lists provided and input linear feet of impact.						
ONLY change values in the blue boxes. All scores and values will be calculated automatically.						
			Oxbow			
	Stream Reach 1		**Stream Reach 2**		**Stream Reach 3**	
Name/Description	**Installation of grade control structure**		**Restoring Stream Channel**		**Restoring Stream flood plain**	
Factor	**Type**	**Score**	**Type**	**Score**	**Type**	**Score**
Stream Type	Perennial	0.40	Perennial	0.40	Perennial	0.40
Priority Waters	Tertiary	0.05	Tertiary	0.05	Tertiary	0.05
Net Benefit	Excellent	3.50	Excellent	3.50	Excellent	3.50
Site Protection	**Choose One**	**	3rd Party Grantee	0.20	**Choose One**	**
Credit Schedule	**Choose One**	**	Schedule 1	0.30	**Choose One**	**
Sum of Factors (M)		3.95		4.45		3.95
Linear Feet of Benefit (LF)	150		300		60	
Reach Credits Generated (RC)		**592.50**		**1335.00**		**237.00**
Project Credit Subtotal		**2164.50**				
Location & Kind Multiplier	**Choose One**	1.00				
Design Process Multiplier	B - Stability Analysis	1.10				
Monitoring Process Multiplier	B - Stability Monitoring	1.10				
TOTAL MITIGATION CREDITS EARNED		**2619.05**				

Stream Mitigation Tours

June 16, 2016
Site #2: Four Mile Creek – Copper Creek

Overview: This is a site located along Four Mile Creek near the Copper Creek development in Pleasant Hill, Iowa. This site is along the same creek (Four Mile) as the next site, but shows restoration practices in-place. Improvements to the creek were made to protect the trail and ultimately the lake outlet and the lake itself. The restoration work at this site is began very recently, and were designed by Snyder and Associates.

2015 Aerial Photo

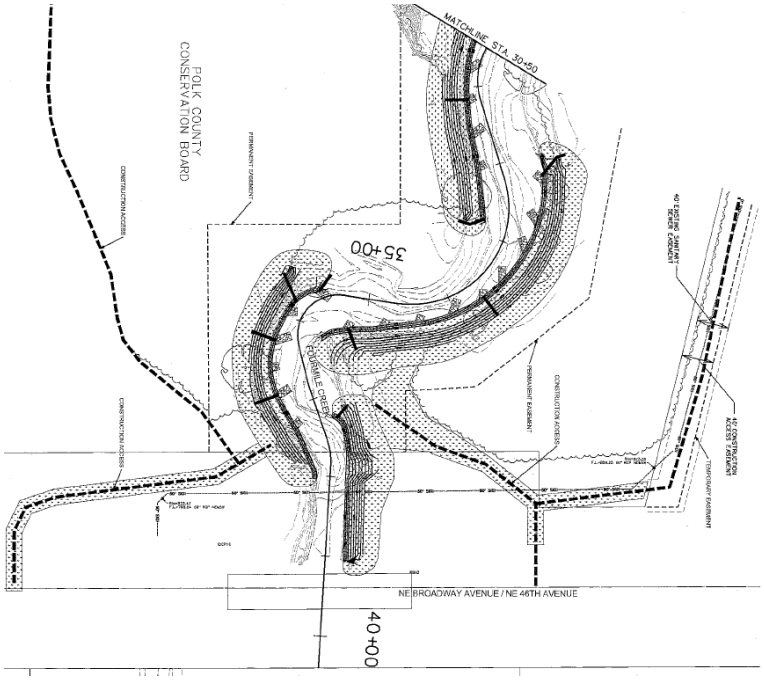
1930's Aerial Photo

Stream Mitigation Tours
June 16, 2016
Site #3: Four Mile Creek – NE Broadway

Overview: This is a site located along Four Mile Creek just north of NE Broadway Avenue in NE Des Moines. This is a project funded by the SRF Sponsored Project program. This site is planned for construction, with design completed by Snyder and Associates. The site will ultimately have flood plain benches, rip rap placement, sloping back of the upper bank, longitudinal peak stone toe protection, and native vegetation. This site will require a short walk through tall grass to access a recreational trail, and then will allow for easy observation of the unrestored segments. The restoration work at this site is slated to begin in 2016.

2015 Aerial Photo

1930's Aerial Photo



Mitigation Score Information:

IOWA STREAM MITIGATION SUMMARY

Project Name	Four Mile Creek
Date	6/1/2016

Required Mitigation	Debits
Adverse Impacts	0.00

Credit Summary	Credits
In Stream Benefits	4625.00
Riparian Buffer Benefits	3014.75
Fish Passage Credits	0.00
Total Excess Credits	7639.75

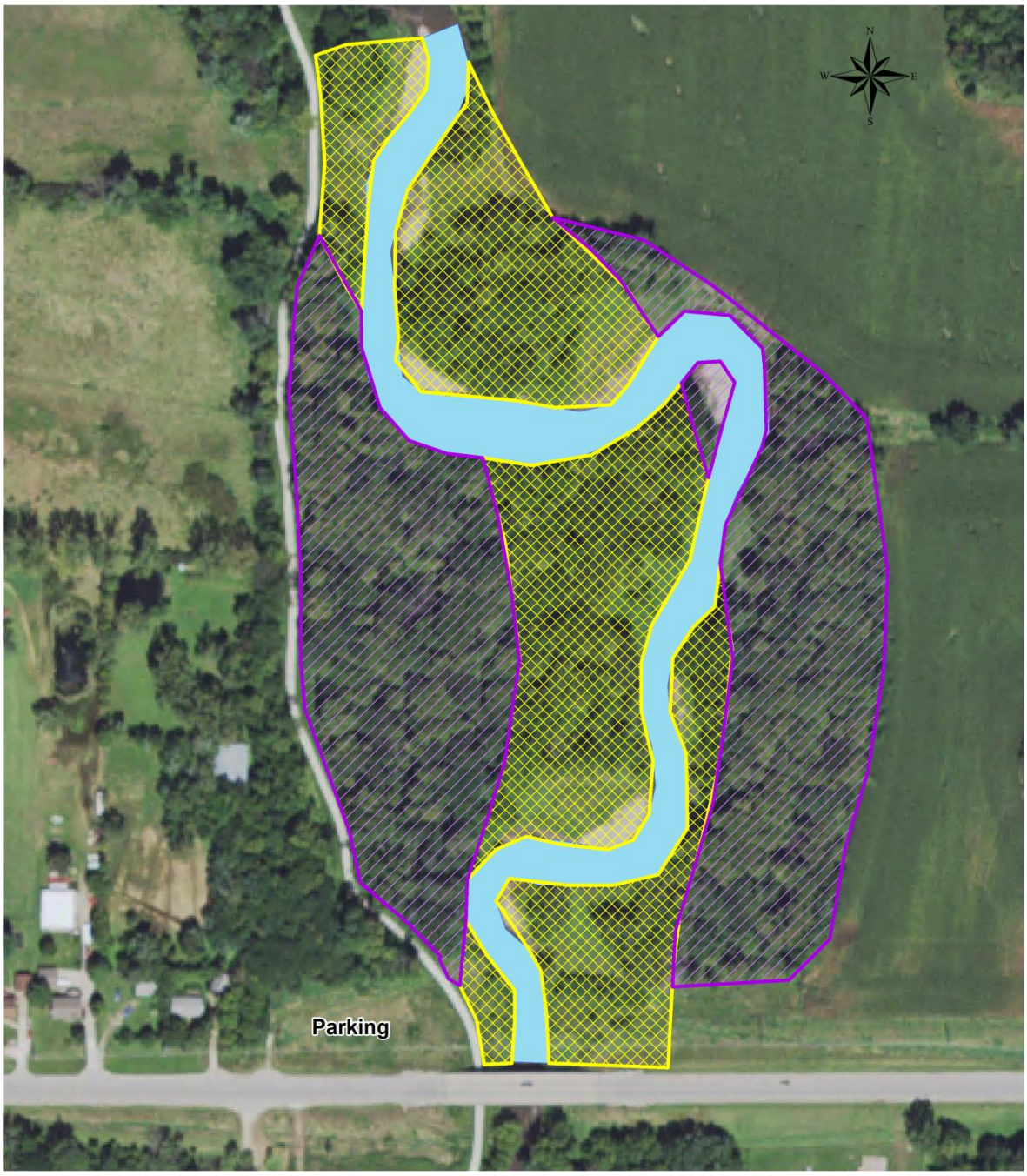
IN-STREAM BENEFITS WORKSHEET

Project Name	Four Mile Creek			Date	6/1/2016
Instructions - For each stream reach, choose factor types from the dropdown lists provided and input linear feet of impact.					
ONLY change values in the blue boxes. All scores and values will be calculated automatically.					
			Oxbow		
	Stream Reach 1		Stream Reach 2		Stream Re
Name/Description					
Factor	Type	Score	Type	Score	Type
Stream Type	Perennial	0.40	**Choose One**	**	**Choose One*
Priority Waters	Tertiary	0.05	**Choose One**	**	**Choose One*
Net Benefit	Moderate	1.20	**Choose One**	**	**Choose One*
Site Protection	3rd Party Grantee	0.20	**Choose One**	**	**Choose One*
Credit Schedule	Schedule 3	0.00	**Choose One**	**	**Choose One*
Sum of Factors (M)		1.85		0.00	
Linear Feet of Benefit (LF)	2500		0		0
Reach Credits Generated (RC)		4625.00		0.00	
Project Credit Subtotal		4625.00			
Location & Kind Multiplier	**Choose One**	1.00			
Design Process Multiplier	**Choose One**	1.00			
Monitoring Process Multiplier	**Choose One**	1.00			
TOTAL MITIGATION CREDITS EARNED		4625.00			

RIPARIAN BUFFER WORKSHEET

Project Name	Four Mile Creek		Date	6/1/2016
Instructions - For each stream reach, enter dimensions of buffers and choose factor types from the dropdown lists provided.				
ONLY change values in the blue boxes. All scores and values will be calculated automatically.				
	Buffer Area 1		Buffer Area 2	
Name/Description	Within 4x bankfull width zone		Floodplain zone	
Buffer Dimensions (for info only)	all measurements in feet		all measurements in feet	
Average width of buffer (side A)	170			
Average width of buffer (side B)	170			
Stream length	2500			
Factor	Type	Score	Type	Score
Net Benefit	C) Buffer Preservation	0.60	C) Buffer Preservation	0.60
Functional Zone	A - Up to 4x Bankfull Width	1.20	B - Broad Floodplain	0.50
Site Protection	3rd Party Grantee	0.20	3rd Party Grantee	0.20
Credit Schedule	Schedule 1	0.15	Schedule 1	0.15
Temporal Lag Factor	A) 0 to 5 years	0.00	A) 0 to 5 years	0.00
Sum of Factors		2.15		1.45
Buffer area in square feet		396184		452125
Buffer Credit Subtotal		1703.59		1311.16
Location and Kind Factor	Within HUC8	1.00	Within HUC8	1.00
Credits Generated		1703.59		1311.16
Additional comments or description:				
TOTAL MITIGATION CREDITS EARNED		3014.75		

2015 Aerial Photo



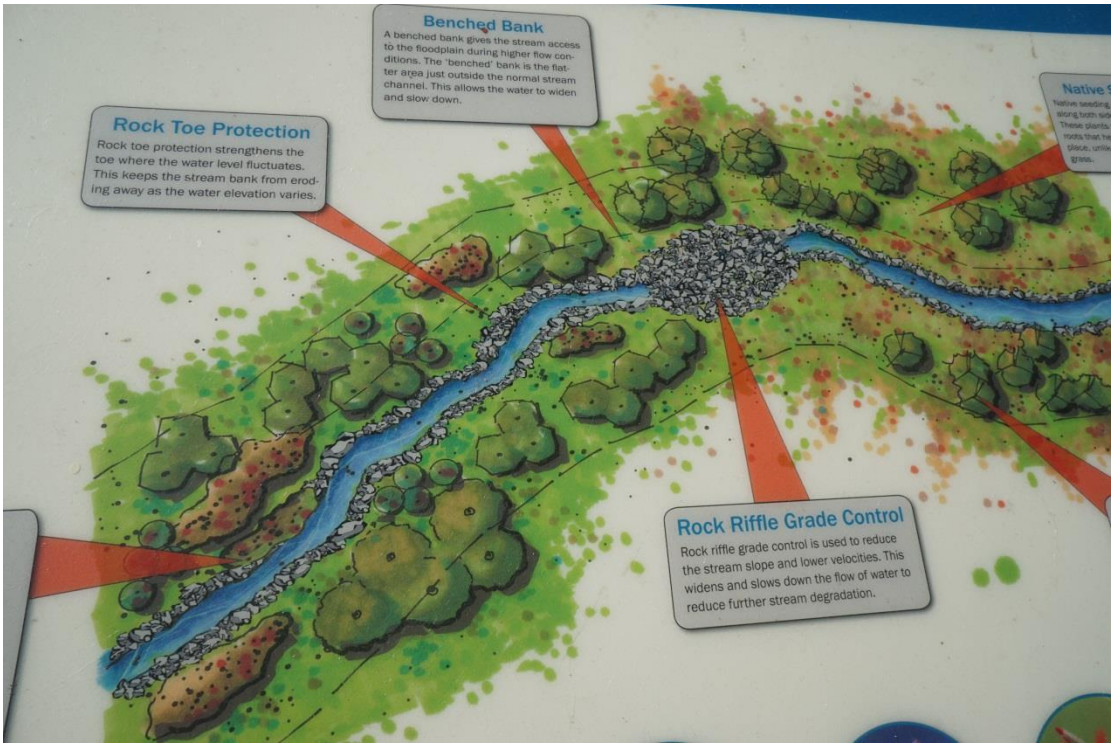
0 50 100 200 300 400 500 600 700 800 900 1,000 Feet

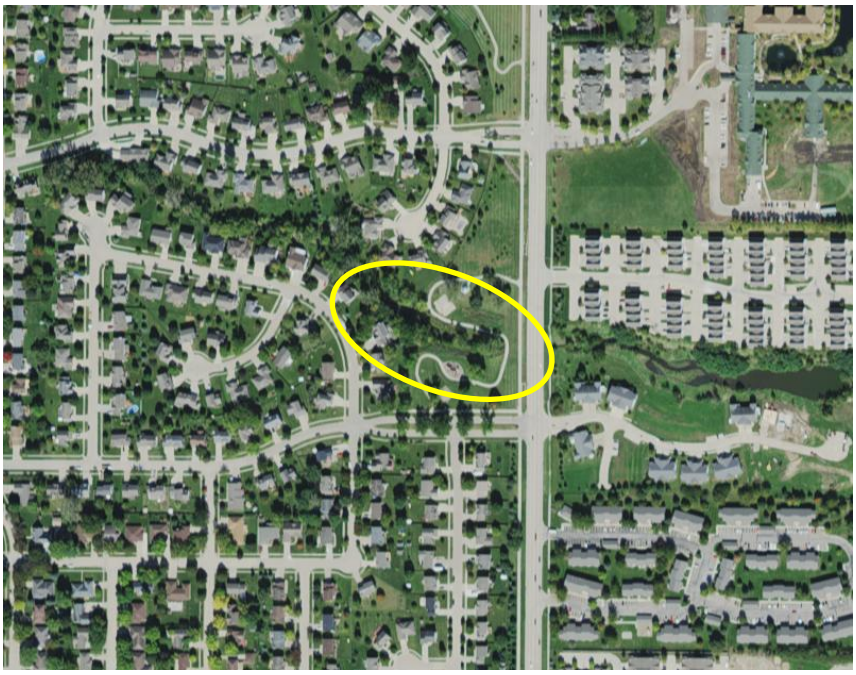
Legend

Riparian Buffer Area 1 | Riparian Buffer Area 2 | Bankfull Width

Stream Mitigation Tours
June 16, 2016
Site #4: Summerbrook Park

Overview: This is a site located Tributary B of Four Mile Creek in Ankeny, Iowa. This site is located in a city park that includes a walking trail and educational signage. The banks were stabilized 2 or 3 years ago. One side of the stream includes rip-rap, and the other side has a 2 stage stream cross section, riffle-pool structure, and compost grouting with a native seed mix. Native vegetation has been established on the bench and on the upper banks. The restoration work at this site was completed in 2011.





2015 Aerial Photo

2011 Site Photo

LiDAR Hillshade

DRAFT Mitigation Method Scoring:

IOWA STREAM MITIGATION SUMMARY		
Project Name	Summerbrook Park	
Date	6/14/2016	
Required Mitigation	**Debits**	
Adverse Impacts	0.00	
Credit Summary	**Credits**	
In Stream Benefits	660.00	
Riparian Buffer Benefits	110.00	
Fish Passage Credits	0.00	
Total Excess Credits	770.00	

	Stream Reach 1	
Name/Description		
Factor	**Type**	**Score**
Stream Type	Perennial	0.40
Priority Waters	Tertiary	0.05
Net Benefit	Moderate	1.20
Site Protection	No 3rd Party Grantee	0.00
Credit Schedule	Schedule 3	0.00
Sum of Factors (M)		1.65
Linear Feet of Benefit (LF)	400	
Reach Credits Generated (RC)		**660.00**
Project Credit Subtotal		**660.00**
Location & Kind Multiplier	**Choose One**	1.00
Design Process Multiplier	**Choose One**	1.00
Monitoring Process Multiplier	**Choose One**	1.00
TOTAL MITIGATION CREDITS EARNED		**660.00**

DRAFT Mitigation Method Cheat-sheet:

Proposed Stream Type factors (same as Missouri Method) and an alternative system:

Stream Type	Adverse Impact Factor	In-stream Benefit Factor
Ephemeral	0.3	0.15
Intermittent	0.4	0.2
Perennial	0.8	0.4

Stream Types	Adverse Impact Factor	In-Stream Benefit Factor
Ephemeral	0.2	0.1
Intermittent	0.4	0.2
Perennial (1st and 2nd order)	0.6	0.3
Perennial (3rd and 4th order)	0.8	0.4
Perennial (≥5th order)	1	0.5

Priority Waters:

Priority Waters	Adverse Impact Factor	In-stream Benefit Factor
Primary	0.8	0.4
Secondary	0.4	0.2
Tertiary	0.1	0.05

Primary: includes Outstanding Iowa Waters, Iowa Protected Water Areas, known mussel beds, and waters with state and federally threatened and endangered species.

Secondary: includes areas with aquatic Species of Greatest Conservation Need, adjacent to approved mitigation sites, or within 2 stream miles up- or down-stream of waters on public lands.

Tertiary: all other freshwater systems not ranked as primary or secondary.

In-stream Net Benefit categories:

Net Benefits	In-Stream Benefit Factor
Excellent	3.5
Good	2.4
Moderate	1.2
Stream Relocation	0.5

Excellent: must address multiple stream functions at a large scale and should result in significant environmental lift, such as those that are predicted to raise the Ecoregionally-adjusted Fish Habitat Index (EFHI) by two categories (poor to good, fair to excellent). Examples include dam removal, fish passable grade control structures, floodplain reconnection, restoring sinuosity, oxbow restoration, and use of native stone and wood for stabilization.

Good: project will have localized benefits, such as those that raise the EFHI by a minimum of 10 points.

Moderate: project benefits limited to the reach, itself, and are not expected to result in measurable change in aquatic habitat. Examples include removing small structures, grade control, riffles and other structures used to control slope, and use of hard materials in combination with native vegetation to train flow and enhance local channel stability and aquatic habitat.

Project Accommodation: includes creation of new stream to accommodate construction.

Credit schedule:

All mitigation banks qualify for **Schedule 1.** Permittee-responsible mitigation (PRM) qualifies for **Schedule 1** when 80-100% of work will be completed before impacts occur.

PRM projects qualify for **Schedule 2** if 50-80% of construction and planting are completed prior to impacts.

All in-lieu fee (ILF) programs qualify for **Schedule 3**, along with PRM projects where less than 50% of the work will be completed before impacts.